

Phase #2 of Computer-Supported Coordinated Care Project

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January 2004

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Computer-Supported Coordinated Care Project Summary

The purpose of the Computer-Supported Coordinated Care (CSCC) project is to identify the characteristics and needs of the support networks for elders who wish to remain at home (i.e., “age in place”). Ultimately our goal is to develop technology to help this population. In a three phase study towards this end, we developed an empirical approach focused on the wide range of people involved with home elder care.

We explored care networks—*support networks* of friends, families, and professionals who contribute to the care of an elder—and identified the characteristics and needs of those involved in the care—the *network members*. We examined and analyzed existing communication methods and information types and flows of the support network members. We then applied this knowledge to the design of a prototype technology, the CareNet Display, intended to support the coordination activities of network members. Further, we deployed this prototype in the homes of representative network members, gathering and analyzing data about how the technology affected their lives. As a result of this research, we recommend further exploration of the CareNet Display as well as other tools for the emerging field of Computer Supported Coordinated Care.

Our study was conducted in 3 phases:

- Phase #1: Semi-structured interviews with eldercare stakeholders to establish the CSCC approach
- Phase #2: Roundtable discussions with network members to establish design specifications for possible technologies to support the network
- Phase #3: In-situ deployment of a prototype technology, the CareNet Display, to explore how technology-based systems might improve the lives of the support network members

This report covers Phase #2. Reports for Phase #s 1 & 3 are also available.

Phase #2 Overview

Before designing a prototype technology to help the members of an elder's support network, we needed to better understand what was important to the technology's potential users. Specifically, we wanted to explore the following questions:

- What information is important to network members?
- What technologies could they imagine using to communicate/coordinate with other network members?
- How can we formulate a solution? What are the expected benefits and constraints of that solution?

To investigate these questions, we conducted roundtable discussions in Summer 2003 with members of a variety of support networks. All participants were family members of elders who require regular care. From our findings, we discuss recommendations for building technology to help members of an elder's support network; we used these findings to inform the design of our own prototype technology, the CareNet Display. In this report, we include the study details and discuss the results we feel help inform the design of CSCC technologies.

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Study Details

Phase #2 data collection was conducted from June 27 to August 4, 2003 by Sunny Consolvo and Peter Roessler. It included a series of four roundtable discussions with members of various elders' support networks. In this section, we discuss the profiles of the participants and details regarding the roundtable discussions.

Participant profiles. Participants in the roundtable discussions were members of various support networks. In all cases, the participants were related to the elder for whom they were concerned; they were usually the children or spouse of the elder. They participated in the support network at either the *drastic life change* or *significant contributor* level¹. A variety of methods were used to recruit Phase #2 participants: team members gave presentations at community geriatric care professionals' networking conferences, consulted with eldercare domain experts, contacted the family of elders involved in other parts of this research, and used a professional market research recruiting firm. Some other recruiting methods were attempted that eventually proved unsuccessful, such as contacting senior computer resource centers, sending email to distribution lists within the University of Washington, and contacting personal friends. Participants were:

- Roundtable A: 7 network members of elders who live alone, conducted at Intel Research Seattle; 3 female, 4 male. Ages were 44-67;
- Roundtable B: 4 network members of elders who live alone, conducted at a local Senior Center; 3 female, 1 male. Ages were 51-65;
- Roundtable C: 3 network members of elders living at an assisted living facility, run at the assisted living facility; 2 female, 1 male. Ages were 56-75; and
- Roundtable D: 3 network members of elders living at an assisted living facility, run at the assisted living facility; 2 female, 1 male. Ages were 51-55.

Roundtable discussions. For all sessions, Peter Roessler served as a moderator and Sunny Consolvo served as note-taker. The discussions were conducted in three locations, based on the participants' preferences: at Intel Research Seattle, a local senior center, and a local assisted living facility. Participants received an incentive of \$50 US. Session length averaged 90 minutes. Data was collected in the form of participant-completed questionnaires and exercise cards, investigator notes, audio recordings, and video recordings.

Each session began with a consent form and pre-roundtable questionnaire [Appendix A] that were filled out by all participants. Next, participants completed a support network exercise to help us understand the various people involved in each elder's support network. The roundtable discussions consisted of three activities. Part I detailed the types of information each participant wanted about the elder for whom they were

¹ *drastic life change member*— has made drastic changes to his/her own life to provide the elder with the type of care s/he requires to remain at home

significant contributor— makes significant contributions to the elder's care and has a daily concern for the elder, but is still able to maintain their own lives as a primary focus

Please see report for Phase #1 Interviews for more details

concerned. Part II explored the types of technologies the participants could imagine using to communicate/coordinate with other network members. Part III was a group discussion about “alerts”. Details follow...

Part I: Important information. Part I of the roundtable was used to explore the various types of information that a network member might want to know about the elder for whom she is concerned. The types of information discussed were taken from the 20 types of information identified in Phase #1 of this research project [see report for Phase #1 Interviews] and are listed below. The information types were printed on index cards. Each participant was given a set of 20 cards—one for each type of information [see Appendix B for sample cards]. The cards were also intended to allow the participants to indicate the level of detail they wanted about each information type. We have not included the results from the “level of detail” exercise, because it was too confusing for several of the participants in the group setting. The 20 types of information were:

- | | | |
|--------------------|-------------------|----------------|
| ▪ activities | ▪ dressing | ▪ outings |
| ▪ bathing | ▪ falls | ▪ phone calls |
| ▪ calendar | ▪ household needs | ▪ toilet use |
| ▪ car trips | ▪ meals | ▪ visits |
| ▪ disease-specific | ▪ medications | ▪ vitals |
| measurements | ▪ messaging | ▪ water intake |
| ▪ distance walked | ▪ mood | ▪ weight |

To identify the types of information about the elder that were important to participants, they each completed a card sorting exercise where they separated the information types into one of the following five categories:

- Definitely want/need the information
- Nice to have the information
- Don’t mind if they have the information or not
- Don’t want/need the information
- Don’t know if they want/need the information

The card sorting exercise was followed by a brief group discussion about the importance of the information, and what was missing from the list of 20 information types.

Part II: Exploring technology concepts. The next group of exercises explored how participants felt about a variety of technology concepts that could be used to communicate and coordinate care activities with other network members. These exercises were not used to decide exactly what form factor we should build, but rather to tease out issues of lifestyles and daily routines that might affect CSCC technologies.

We chose nine different technology concepts that could be used to help a support network with the tasks of information dissemination and care activity coordination. Both “push” and “pull” update models were represented by the nine concepts which included conventional applications and interfaces (e.g., phone services, websites, and email) and

exploratory ambient displays suggested in the research literature (similar to the Digital Picture Frame from GA Tech).

Each concept was presented in the form of a 24" X 36" poster [see Appendix C] and accompanied by a brief description from the discussion moderator; participants were free to ask questions at any time during the concept unveiling. Posters were placed around the room such that participants could see all posters (see Figure 1). The nine concepts were:

- Interactive digital picture frame: representational icons
- Interactive digital picture frame: nonrepresentational/abstract icons
- Password-protected website
- Computer screen background
- Instant message-like interaction
- Handheld device (PDA) or mobile phone text message
- Phone call: A service calls with a recorded message
- Phone call: Place a call to a recorded message
- Receive an email



Figure 1: Technology concept posters displayed around the room for roundtable discussion participants. The moderator briefly described each concept prior to the concept exercises; participants were free to ask questions. The posters were not shown until Part II of the roundtable.

The general ideas for the nine concepts were [see Appendix C for posters]:

Interactive digital picture frame², with representational icons. This was one of two ambient display concepts. A photo of the elder appeared on a digital touch screen surrounded by icons representing specific types of information about the elder; the entire form factor looked very similar to a regular



² The two digital picture frame concepts are similar to the Digital Family Portraits prototype at GA Tech, with changes based on the results of the Phase #1 Interviews

picture frame, except that it had to be plugged into an outlet. The icons were designed to visually describe the information type it represented (e.g., the icon for meals was represented by the international symbol for restaurant—the fork & knife shown above). While the appearance of the icons themselves conveyed some information, the touch screen nature of the device allowed users to get more details by touching an icon. In this concept, the device was automatically updated.

The interactive digital picture frame, with nonrepresentational/abstract icons. This was the other ambient display concept. It works just as the concept above except that instead of using representational icons, abstract shapes were used to represent the same information. The purpose of these abstract shapes was to conceal the meaning of the underlying information it represented (e.g., so a visitor who saw the picture frame would not know what information was being shared about the elder).

Password-protected website. Network members have access to the elder's information through a secure website. Members log in to the site to see the elder's most up-to-date information. This website would be accessible from anywhere Internet access is available. In this concept, the user has to go to the website when s/he wants an update.

Computer screen background. Network members receive information about the elder directly on her own desktop or laptop. Icons would reside on the background screen and show information details with interaction (the representation could be similar to the picture frames and/or website). Application windows would function over the screen. This background could be seen by anyone within view of the monitor. In this concept, the information is automatically updated.

Instant message-like interaction. Network members receive information about the elder directly on his/her own desktop or laptop, in an interaction style resembling instant message applications such as AOL Instant Messenger®. A notification window appears when a new update is available and can be clicked on to launch a website containing details. The message would no longer be available after closing the instant message window, but it also would not require the user to remember to check for updates. The user could access the website anytime as above.

Handheld device (PDA) or mobile phone text message. Network members receive updates through a mobile device, either as text or with graphic-rich layouts. Similar to the picture frame concepts, the updates are automatic. However, the mobile nature of the device allows the user to travel with the information.

Phone call: A service calls with a recorded message. Network members receive a scheduled phone call from an automated system that delivers a recorded message

with a summary of the day's information. Users get more information by using a phone menu style system (e.g., "For more on meals, press '1'...").

Phone call: Place a call to a recorded message. Network members have a phone number to call whenever they want to find out the latest update about the elder (it would be protected by a PIN). The system would have a recorded summary, and again, users could get more information using a phone menu style system. Unlike the other phone call concept, the user has to remember to call this service.

Receive an e-mail. Similar to the phone call concept where the service calls the user, network members receive a scheduled update about the elder through email.

Each participant was given index cards with thumbnail images of each technology concept (i.e., each participant received nine index cards—one for each concept). They identified the two concepts they liked most, then each completed a card sorting exercise where they separated the concepts into one of the following six categories:

- I would definitely want this
- I would probably want this
- I'd use it if it were given to me
- I probably wouldn't want this
- I would never want this
- I don't know if I would want this

Again, a brief group discussion followed the technology concept exercises, talking about the plusses and minuses of the various concepts.

Part III: A discussion of alerts. We concluded the roundtable with a brief group discussion about alerts. The moderator asked the participants about how alerts are currently handled in their networks (e.g., what causes an alert, which network members are alerted, how they are alerted, etc). The discussion included what devices were already being used by networks, e.g., emergency call buttons like the Lifeline® device.

Results

In this section, we discuss the results of our roundtable discussions, grouped by the questions we were trying to answer:

- What information is important to network members?
- What technologies could they imagine using to communicate/coordinate with other network members?
- How can we formulate a solution and what are the expected benefits and constraints of that solution?

What information is important to network members? As mentioned, the participants were asked to group the 20 information types into the following categories:

- definitely want/need the information
- nice to have the information
- don't mind if they have the information or not
- don't want/need the information
- don't know if they want/need the information

To create a list ranked on importance, we sorted each information type by category. The resulting ranking is (where 1 is *most important*):

| | | |
|-------------------------------------|--------------------|---------------------|
| 1) falls | 7) calendar | 14) messaging |
| 2) meals | 8) household needs | 15) bathing |
| 3) disease-specific measurements | 9) activities | 16) car trips |
| 4) medications | 10) outings | 17) distance walked |
| 5) vitals | 11) visits | 17) dressing |
| 6) mood | 12) weight | 18) phone calls |
| | 13) water intake | 19) toilet use |

The ranking is numbered from 1-19, because two information types tied for 17th place—*distance walked* and *dressing*. The group discussion that followed gave us insight into the rankings. For example, most participants viewed *phone calls* (either made by or to the elder), which came in 18th place out of 19, to be invasive and unnecessary. However to some members, other low-ranking information types were considered quite important, depending on the conditions of the elder. For example, in many of the support networks, the elders no longer drove, making information about *car trips* unnecessary. However, in networks where the elder still drove, updates about car trips were critical—in fact, it was a big source of stress for these network members. Similarly, *toilet use* was important to networks where the elder experienced incontinence; however, most elders about whom the study participants were concerned did not have this condition.

During the group discussion, we asked what types of important information were not included in the set of cards. Only two were suggested, but they came up consistently: *sleep* and *financial information*. Regarding sleep, participants were interested in how much sleep the elder got, when the elder slept (e.g., 8pm – 4am), the quality of sleep, if the elder's sleep was disrupted (e.g., by a trip to the bathroom), and if the elder sleepwalked. Financial information included: “is anything overdue?,” “what’s coming due?,” bank account activity (e.g., “is mom spending too much?,” “to who is mom giving money?”), or the status of the elder's entire financial portfolio.

Also discussed was frequency of updates. In most cases, the idea of a daily update seemed reasonable. For some participants, less frequent information would be fine (these participants typically participated in the elder's care less than others). For other participants, more frequent updates would be needed for certain types of information.

The roundtables also included a discussion about alerts. The #1 reason participants wanted to be alerted was if the elder fell. Many networks already have an emergency call button device/service, such as Lifeline®. These services disseminate alerts through phone calls to an established hierarchical list when the elder presses a button s/he is supposed to wear at all times. Though this is an often-purchased service, and members are more comfortable when the elder in their network has one, it is not problem-free. For example, one member recalled a time that she received a voice message from the service in the middle of the night that her mother was being taken to the hospital. It turned out to be a false alarm; her mother was not taken to the hospital, but no one followed up to let her know there was no emergency after all. Also, throughout this phase and Phase #1, we were warned that elders do not consistently wear their devices, despite the fact that the devices come in necklace and bracelet form factors (see Figure 2) and are lightweight³. Network members were also interested in alerts for missed appointments and medication errors (e.g., overdoses, missed medications, out of stock medications, etc).



Figure 2: Lifeline® bracelet

As mentioned earlier, the exercise of identifying the level of detail about the various information types proved too confusing for many of the participants in the group setting. We have therefore not included those results in this report. The intent of that exercise was to provide sensor designers/researchers with information to build the sensors that could collect such information. An investigation into how to build sensors aimed at gathering CSCC information remains an opportunity for future work.

What technologies could network members imagine using to communicate/coordinate with other network members? Participants were asked to choose their two favorites of the nine technology concepts and then to sort them into the following bins:

- I would definitely want this
- I would probably want this
- I'd use it if it were given to me
- I probably wouldn't want this
- I would never want this
- I don't know if I would want this

To create a ranked list, we sorted each concept by bin, giving priority within bins to concepts that were identified as a favorite. The ranking of the technology concepts was (where 1 is *best*)...

³ We heard three different reasons that elders do not consistently wear their devices: 1) it's a stigma that they need help, 2) it's ugly and they only wear one necklace or bracelet at a time—they'd rather wear a nice piece of jewelry, and 3) they take it off to wash their hands or put on cream, then forget to put it back on.

- 1) Receive an automated phone call with a recorded message
- 2) Place a call to hear an automated recorded message
- 3) Instant message-like interaction
- 4) Handheld computer/PDA or mobile phone text message
- 5) Computer screen background
- 6) Receive an e-mail
- 7) Interactive digital picture frame, with nonrepresentational/abstract icons
- 8) Web page
- 9) Interactive digital picture frame, with representational icons

We were less interested in the resulting list and more interested in the group discussions that followed so that we could learn about the factors that were important to network members (the concept exercise was more of a tool for discussion than a test of ideas). Based on the popularity of phone calls from the Phase #1 Interviews, we were not surprised that the two phone call concepts ranked the highest. What the discussion suggested was that the reason most participants preferred either of the phone call concepts was that they imagined they could access the information from anywhere, even when they were on vacation. Though an email or website based solution could arguably have the same properties, several participants were not frequent web or email users. The concepts of the digital picture frame ranked low on the list; we believe this was because the participants just couldn't imagine what an interactive digital picture frame could be like. Interestingly, most participants liked the idea of a handheld device, but mentioned two big problems with it: 1) they cannot read the small screens and 2) they would need to remember to have it with them all the time (unlike a phone, which they are already used to carrying). Despite these caveats, the handheld device ranked high because the participants liked the idea and hoped the problems could be overcome in the near future. There was no clear preference when it came to the push vs. pull model of receiving updates; this seemed to have more to do with individual lifestyles. For example, in general, participants who had busy lives (particularly those with demanding jobs), preferred the push model where they were notified of updates and did not have to remember to check for them. In contrast, participants who were retired or had less demanding jobs typically preferred the model where the computer system did not bother them, but rather they could check for information when they felt like it.

The most important take-away from the concept discussion was that most participants would want two ways to get the information: 1) a way to acquire information at home, but that would not be bothersome, and 2) a mobile method for acquiring information that could accompany them wherever they went so they could always be informed.

How can we formulate a solution? What are the expected benefits and constraints of that solution? The roundtable discussions have given us a better understanding of what types of information are important to various network members. We have also identified some of the important factors in designing a technology to help them. For example, a network member's willingness to use technology is often dependent on his/her age and experience. Many network members of elders are elderly themselves and therefore apprehensive about using anything that looks too much like a computer (or "the

scary gray box” as we heard it described). eMail was not a viable option for today’s networks, given that a majority of the members often do not use it regularly or at all.

Technologies to support these networks should attempt to reduce the stress levels of network members. This includes not introducing new tasks (e.g., having to learn how to use a website and remembering to check it everyday) or being intimidating to users who are not technically savvy. Despite the low ranking of the digital picture frame concepts, we believe this is a great opportunity to explore the use of ambient displays (e.g., the Digital Family Portraits work going on at GA Tech). It is important for designers to remember that not all network members want or need equal access to all information. It is also important for designers to remember that these members are often at least 50 years old and in many cases, in their 60s and 70s. They often have their own lives, jobs, families, and often health conditions to consider. It is likely that different networks will have different needs; a one-size-fits-all solution may not be appropriate. In fact, it’s quite possible that the same network’s needs will change over time as the elder’s condition and dynamics of the network change. This means designing for flexibility.

The next step is to start exploring technology concepts by creating prototypes and testing them with representative users, ideally in-situ. We also need to determine if sensors are a viable solution, one that is reliable and acceptable from the perspective of the elder and network members. Phase #3 of this project was our initial exploration into the area of possible technologies for this population.

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Appendix A:

Pre-roundtable Questionnaires

NOTE: the term "parent" below refers to your parent **who receives regular care.**

1. Your gender: ☐ Male ☐ Female
2. How old are you?

| | | |
|--|--------------------------------|--------------------------------------|
| <input type="checkbox"/> 50 or younger | <input type="checkbox"/> 66-70 | <input type="checkbox"/> 86-90 |
| <input type="checkbox"/> 51-55 | <input type="checkbox"/> 71-75 | <input type="checkbox"/> 91 or older |
| <input type="checkbox"/> 56-60 | <input type="checkbox"/> 76-80 | |
| <input type="checkbox"/> 61-65 | <input type="checkbox"/> 81-85 | |
3. Where do you live? (City, State) _____
4. For how many years have you lived there?

| | |
|--------------------------------------|---|
| <input type="checkbox"/> 0 – 1 year | <input type="checkbox"/> 6 – 9 years |
| <input type="checkbox"/> 2 - 3 years | <input type="checkbox"/> 10 – 15 years |
| <input type="checkbox"/> 4 – 5 years | <input type="checkbox"/> 16 or more years |
5. What is your occupation?
6. Which of the following best describes your current employment status? (check one)

| | |
|---|-------------------------------------|
| <input type="checkbox"/> Full-time employed | <input type="checkbox"/> Retired |
| <input type="checkbox"/> Part-time employed | <input type="checkbox"/> Student |
| <input type="checkbox"/> Homemaker | <input type="checkbox"/> Unemployed |
7. Which of the following best describes your current marital status? (check one)

| | |
|---|-----------------------------------|
| <input type="checkbox"/> Single | <input type="checkbox"/> Married |
| <input type="checkbox"/> Single, living w/someone | <input type="checkbox"/> Divorced |
| | <input type="checkbox"/> Widowed |
8. What is your relationship to the elder?

| |
|---|
| <input type="checkbox"/> spouse / partner |
| <input type="checkbox"/> child |
| <input type="checkbox"/> sibling |
| <input type="checkbox"/> grandchild |
| <input type="checkbox"/> other family (relationship: _____) |
| <input type="checkbox"/> friend |
| <input type="checkbox"/> someone else: who? _____ |
9. For how long have you been concerned about your parent's daily well-being?

| | |
|--------------------------------------|---|
| <input type="checkbox"/> 0 – 1 year | <input type="checkbox"/> 6 – 9 years |
| <input type="checkbox"/> 2 - 3 years | <input type="checkbox"/> 10 – 15 years |
| <input type="checkbox"/> 4 – 5 years | <input type="checkbox"/> 16 or more years |

10. Which of the following best describes the situation with your parent? (check one)

- ☐ I am the only close family/friend who has a regular concern about my parent's care
- ☐ I share the concern for my parent with one or more close family members/friends, but I have primary responsibility for my parent
- ☐ I share the concern for my parent with one or more close family members/friends, but I **do not** have primary responsibility for my parent
- ☐ I share the concern for my parent equally with one or more close family members/friends

11. With which of the following does the elder receive regular assistance?

- ☐ meal preparation
- ☐ running errands
- ☐ household chores
- ☐ using the bathroom
- ☐ bathing
- ☐ getting dressed
- ☐ taking vitals
- ☐ taking other measurements (e.g. blood glucose reading, weight)
- ☐ preparing or administering medication

12. Who provides care for the elder? (check all that apply)

- ☐ you
- ☐ elder's spouse
- ☐ another relative (_____)
- ☐ professional caregiver
- ☐ live-in nurse
- ☐ live-in caregiver
- ☐ other (_____)
- ☐ does not receive care from someone else

13. Which of the following technologies do you use regularly? (check all that apply)

- ☐ The World Wide Web
 - ♦ used _____ times per day/week/month (circle one)
- ☐ Home computer or laptop
 - ♦ used _____ times per day/week/month (circle one)
- ☐ Cell phone
 - ♦ used _____ times per day/week/month (circle one)
- ☐ PDA (personal Digital Assistant)
 - ♦ used _____ times per day/week/month (circle one)
- ☐ eMail
 - ♦ checked _____ times per day/week/month (circle one)
- ☐ Voice Mail (for home, work, or cell phone)
- ☐ Answering machine (for home or work phone)
- ☐ Text messaging
 - ♦ used _____ times per day/week/month (circle one)
- ☐ Ceiva picture frame
 - ♦ do you own the frame? ☐ no ☐ yes
 - ♦ do you update someone else's frame? ☐ no ☐ yes
- ☐ Digital picture frame (other than the Ceiva)
 - ♦ do you own the frame? ☐ no ☐ yes
 - ♦ do you update someone else's frame? ☐ no ☐ yes
- ☐ Other (please include: _____)

14. Where do you regularly use the internet (work & personal use)? (check all that apply)

- ☐ Home
- ☐ Work / the office
- ☐ Public place (e.g., a library, internet café)

15. If you use the internet at home, what kind of connection do you have?

- ☐ 28.8k modem
- ☐ 56k modem
- ☐ High Speed: DSL/Cable Modem/T1/T3/etc. (circle one)
- ☐ Other (please include: _____)
- ☐ I don't know

Thanks!



Appendix B:

Sample Information Type Cards

The information type cards used in Part I of the roundtable discussions were printed in color on 5" X 7" cards. Following are examples of the cards...

Medications

Step 1. What's important?

- ☐ medications not removed from container
- ☐ wrong medication or dose removed from container
- ☐ which medication and dose removed from container
- ☐ with certainty, something was wrong with the elder's medications
- ☐ with certainty, the elder took the medication
- ☐ I'm not interested in medication

Step 2.

| minimum info | bonus info | already get |
|-----------------------|-----------------------|--------------------------|
| <input type="radio"/> | <input type="radio"/> | <input type="checkbox"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="checkbox"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="checkbox"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="checkbox"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="checkbox"/> |

Mood

Examples:

- ☐ good
- ☐ bad
- ☐ OK
- ☐ depressed

Step 1. What's important?

- ☐ general indicator of how the elder is feeling
- ☐ time the elder indicated his/her mood
- ☐ how the elder's mood has changed over the day
- ☐ I'm not interested in mood

Step 2.

| minimum info | bonus info | already get |
|-----------------------|-----------------------|--------------------------|
| <input type="radio"/> | <input type="radio"/> | <input type="checkbox"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="checkbox"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="checkbox"/> |

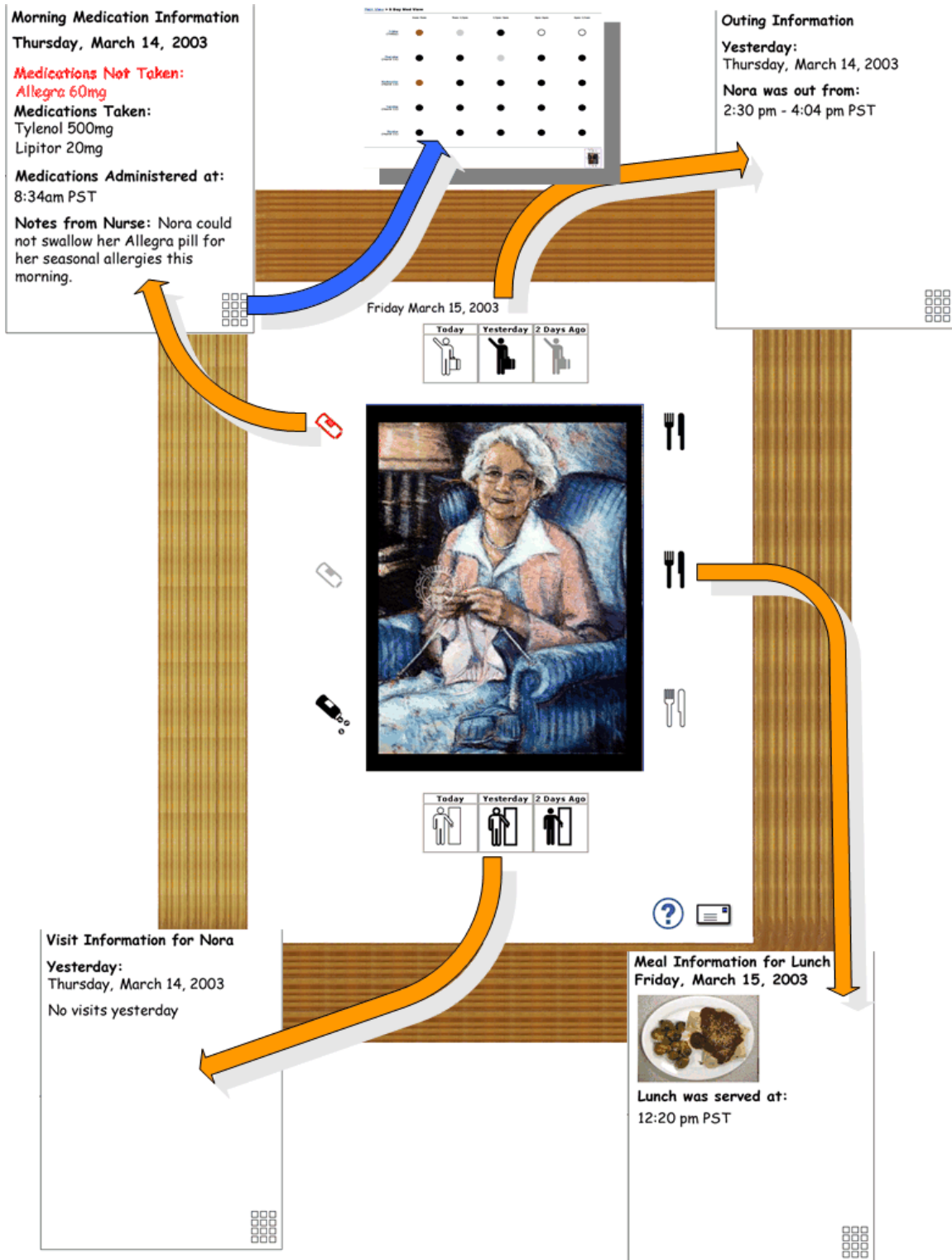
Appendix C:

Technology Concept Posters

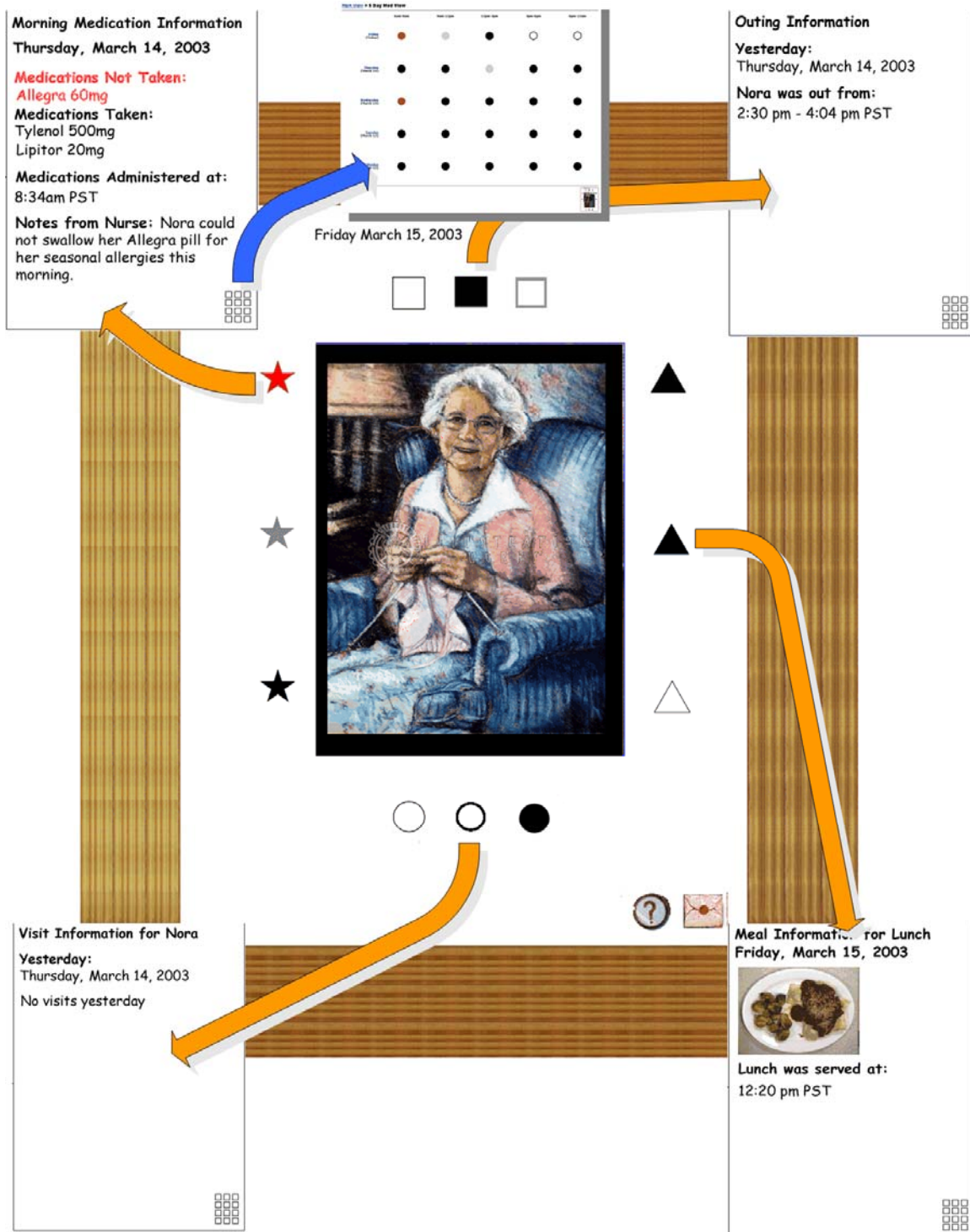
This appendix contains representations of the technology concept posters used in Part II of the roundtable discussions. Each of the following nine concepts were presented in the form of a 24" X 36" poster and accompanied by a brief description from the discussion moderator; participants were free to ask questions at any time during the concept unveiling. Posters were placed around the room such that participants could see all posters. The nine concepts were:

- Interactive digital picture frame: representational icons
- Interactive digital picture frame: nonrepresentational/abstract icons
- Password-protected Web site
- Computer screen background
- Instant message-like interaction
- Handheld device (PDA) or mobile phone text message
- Phone call: A service calls with a recorded message
- Phone call: Place a call to a recorded message
- Receive an e-mail

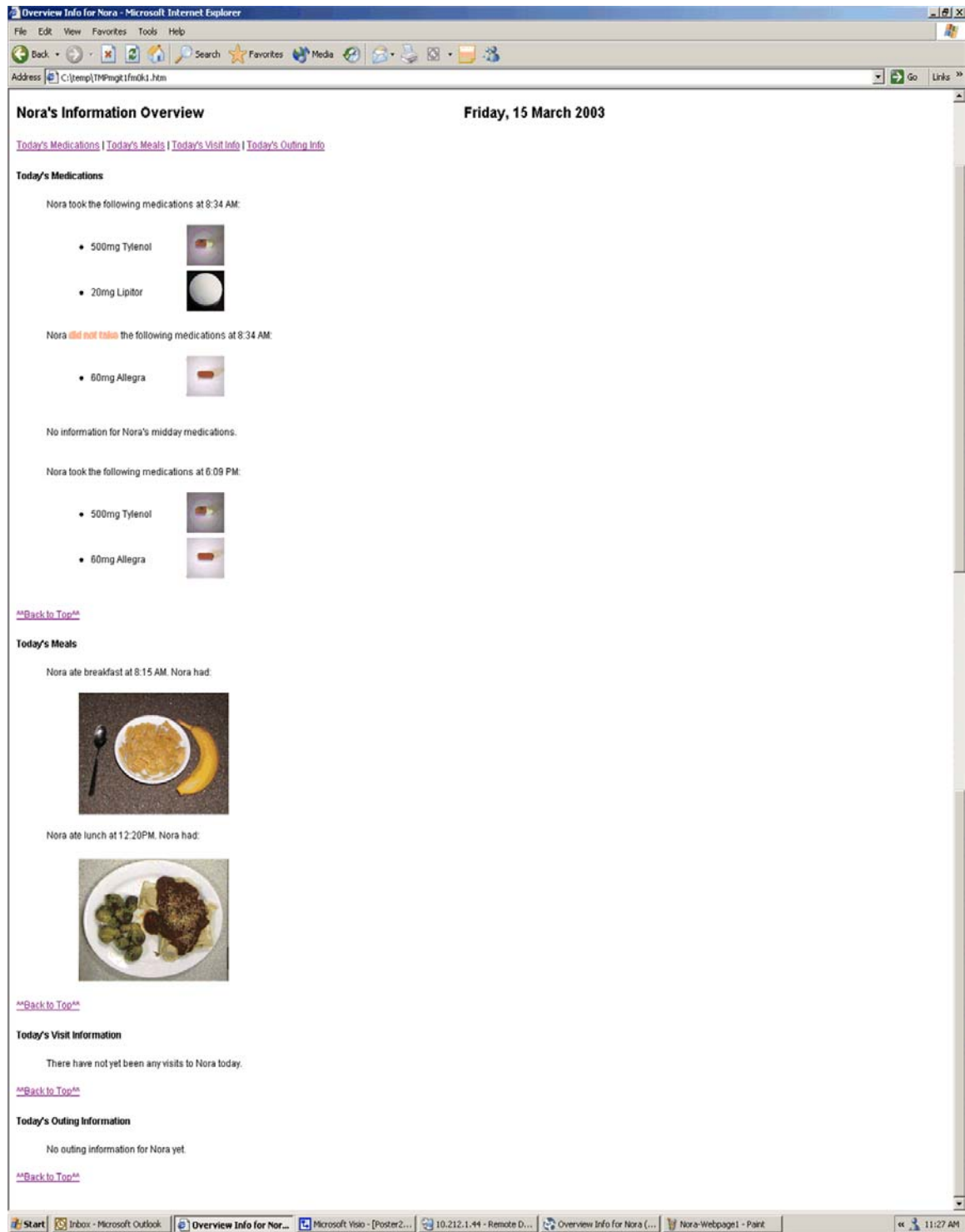
Interactive digital picture frame: representational icons



Interactive digital picture frame: abstract icons



Password-protected website

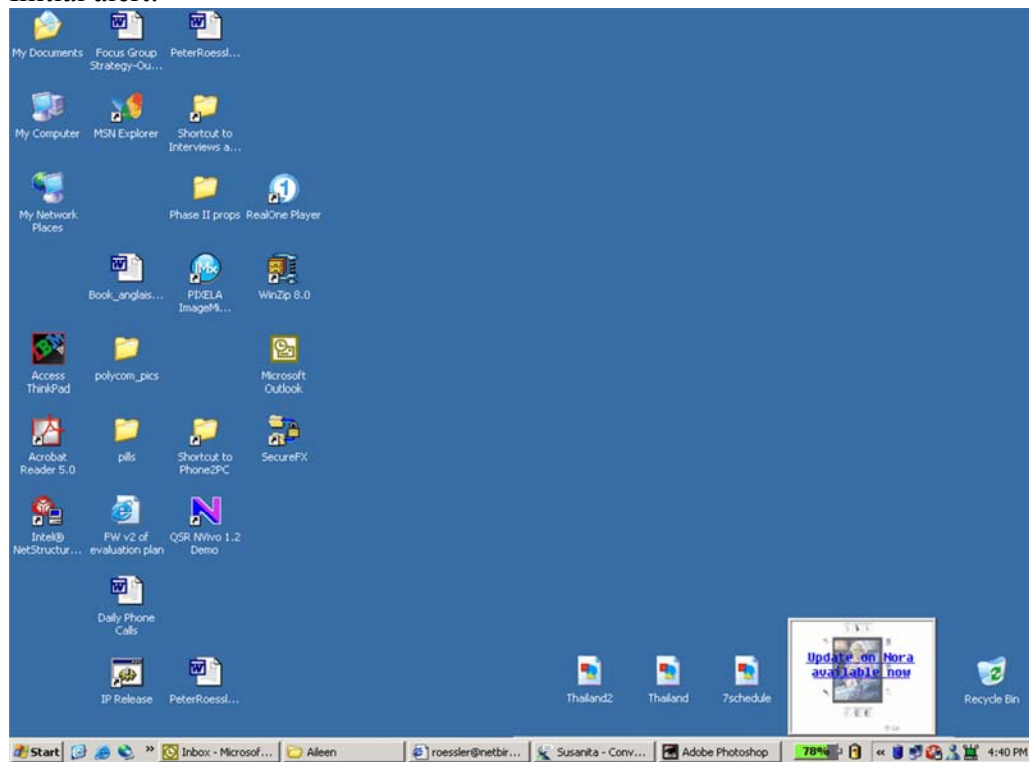


Computer screen background

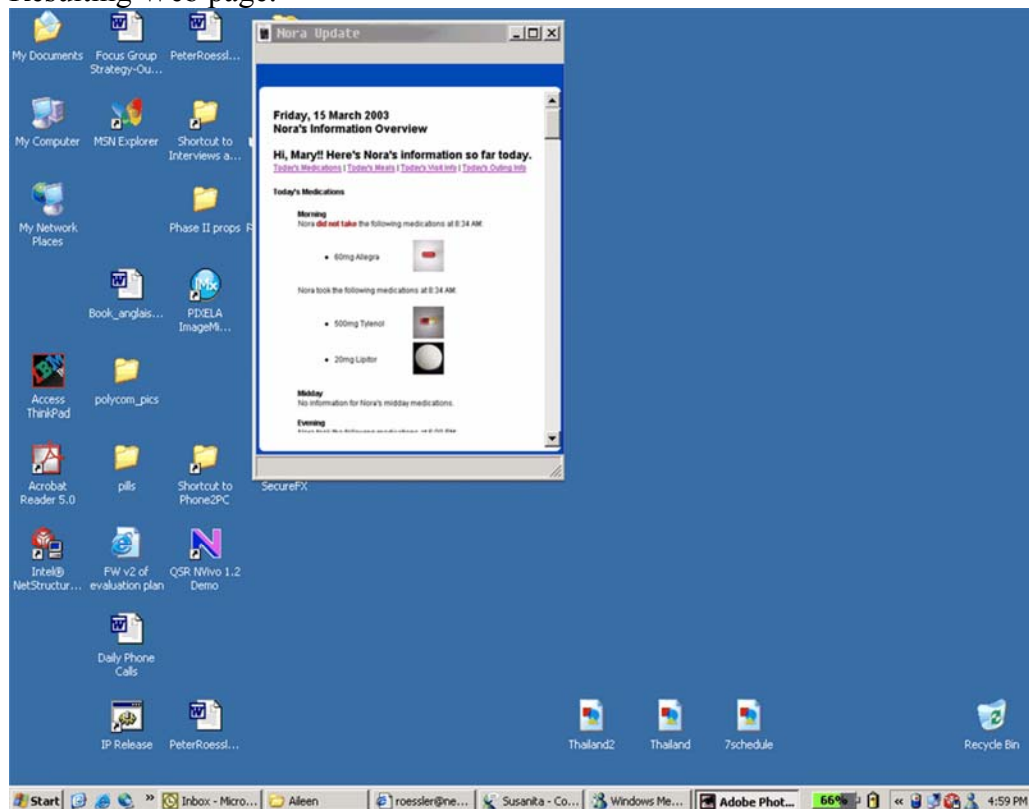


Instant message-like interaction

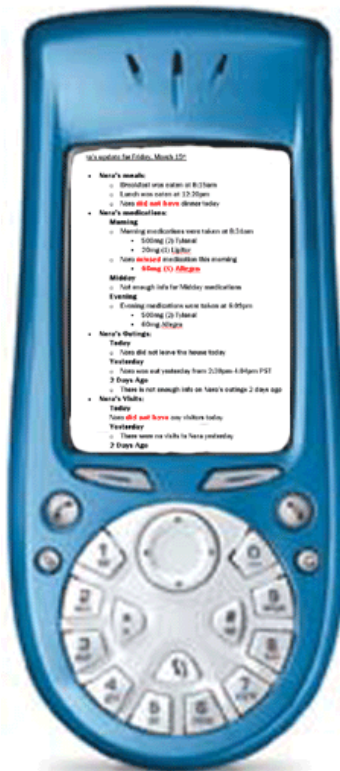
Initial alert:



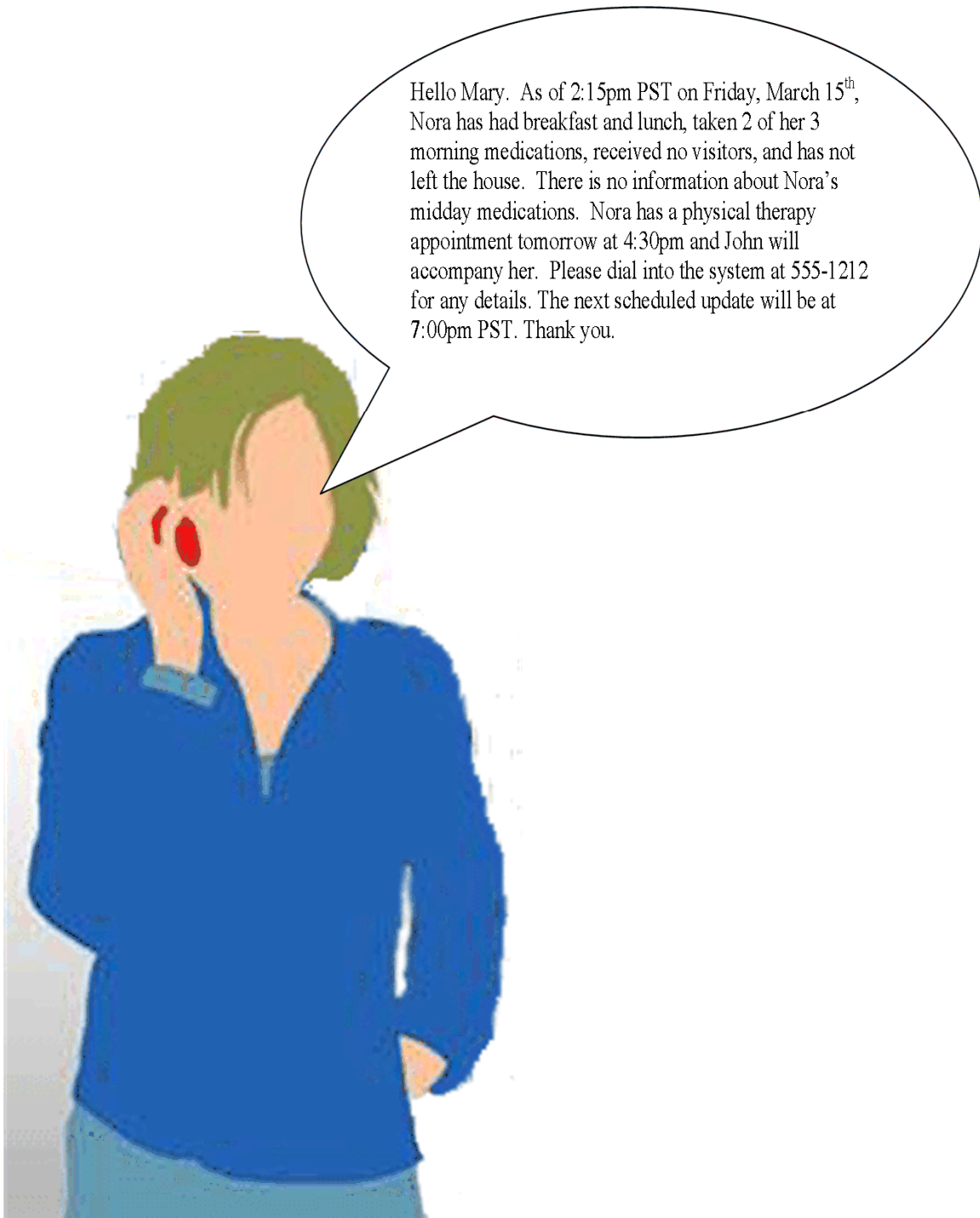
Resulting Web page:



Handheld device (PDA) or mobile phone text message



Phone call: A service calls with a recorded message



Phone call: Place a call to a recorded message



Receive an e-mail

